DE/AFS/SF

ASH GROVE CEMENT COMPANY

WESTERN REGION
230 CEMENT ROAD
INKOM, IDAHO 83245-1543
PHONE 208 / 775-3351
FAX 208 / 775-3509

September 1, 2006

Certified Mail – Return Receipt Requested: 7003-3110-0005-1151-2408

Mr. Bill Rogers
Idaho Department of Environmental Quality
1410 N. Hilton
Boise ID 83706-1255

RE: Cement Kiln Dust Handling System Permit to Construct Application
Ash Grove Cement Company, Inkom, Idaho

Dear Mr. Rogers:

Please find enclosed a Permit to Construct application for a cement kiln dust handling system to be located at the Ash Grove Cement Company facility located in Inkom, Idaho. Ash Grove Cement would appreciate the State processing this application as rapidly as possible.

Also enclosed is a check in the amount of one thousand dollars ($1,000) for the air permit fee.

If you have any questions about this application, please feel free to call me at (208)-775-3351, ext. 36 or Ron Smith at (208)-775-3351, ext. 12.

Sincerely,

Kelly Packard

Kelly Packard
Environmental Manager - Inkom

Permit No.: P-060325
Facility ID No.: 005-00004
PID: SSBG. PTCS
Logged: [✓]

RECEIVED
SEP 06 2006
Department of Environmental Quality
State Air Program

Permit to Construct Application
Cement Kiln Dust Handling System

Inkom, Idaho

Prepared for:

Ash Grove Cement Company
Inkom, Idaho

August 2006

Project No. 010348

Permit to Construct Application Cement Kiln Dust Handling System

Inkom, Idaho

Prepared for:

Ash Grove Cement Company
Inkom, Idaho

Prepared by:

Geomatrix Consultants, Inc.
19203 36th Avenue W, Suite 101
Lynnwood, Washington 98036
(425) 921-4000

August 2006

Project No. 010348

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Inkom, Idaho

1.0 INTRODUCTION

The Ash Grove Cement Company (Ash Grove) operates a cement manufacturing plant in Inkom, Idaho. The plant is governed by a Tier II application issued on November 27, 2002 and a Tier I permit issued December 17, 2002 and modified on January 5, 2006 to incorporate conditions related to a newly installed clinker unloading facility. Ash Grove is proposing to modify these permits to incorporate a cement kiln dust (CKD) handling system and increase the permitted amount of CKD that can be stored on the plant site near the limestone quarry. An emerging market for CKD has prompted Ash Grove to design a new CKD handling system that will facilitate sales by installing equipment for loading CKD into bulk trucks and rail cars. Additionally, Ash Grove is requesting to increase the limit on the quantity of CKD that may be stored on-site. Ash Grove anticipates an increase will be needed while the CKD market is developed and during slow sales periods.

This document provides more detailed information than can be derived from standard Permit to Construct (PTC) forms. It includes 1) an overview of the plant; 2) a discussion of proposed revisions; 3) a discussion of the calculation of PM10 emissions resulting from the proposed revisions; 4) a discussion of potentially-applicable regulations, including PSD and NSPS; and 5) a discussion of the ambient air quality implications of the proposed changes. Appendices provide a process flow diagram (Appendix A), detailed emissions calculations (Appendix B), the standard PTC application Form 1 (Appendix C), and modeling files on compact disc (Appendix D).

For additional detail regarding the existing plant, please refer to the Tier I (Title V) and Tier II operating permit applications Ash Grove submitted to DEQ in August 1999 and December 2002, respectively.

2 PROJECT DESCRIPTION

2.1 OVERVIEW OF THE PLANT

The Ash Grove plant is located on the south bank of the Portneuf River in Inkom, which is in the Marsh Creek Valley about 11 miles southeast of Pocatello. The Marsh Creek Valley is oriented east-to-west where the Ash Grove plant is located, but turns south just to the east of the plant. This portion of the valley is bounded on the north by the Pocatello Range, on the east by the Portneuf Range, and on the south by Indian Mountain. Figure 1 shows the location of the Ash Grove plant and local terrain features.

The plant manufactures Portland cement utilizing the wet process. Limestone rock, extracted in an adjacent and associated open pit mining operation, is crushed, ground and mixed with silica, iron, and alumina. The mixture is then heated to a high temperature in rotary kilns that chemically alter and combine the ingredients to make clinker – hard nodules that are the intermediate product of Portland cement. The clinker is cooled, combined with gypsum, and crushed to a fine powder known as Portland cement. Small quantities of uncalcined limestone may also be inter-ground with the clinker and gypsum.

Emission sources at the Inkom plant may be divided into three categories: rotary kilns, baghouses, and fugitives. Two wet-process rotary kilns are used to produce clinker. The kilns are the only sources of combustion products such as oxides of nitrogen (NOx), oxides of sulfur (SOx), and carbon monoxide (CO). The primary kiln fuels are coal, tire-derived fuel, and natural gas. Used oil and coke are also permitted fuels. The exhaust gases from each kiln exit through a multiclone and a three-field electrostatic precipitator (ESP) for control of particulate matter (PM) emissions.

Besides the kilns, PM is emitted by operations such as quarrying, crushing, handling and storing raw materials, as well as cooling, grinding, handling, and storing product at the facility. There are ten baghouses at the facility that control most of the process sources such as clinker handling and product grinding operations. Although these baghouses are highly efficient and capture approximately 99 percent or more of the particulate matter in the air passing through the bags, small quantities of particulate matter are released from these baghouse exhaust points.

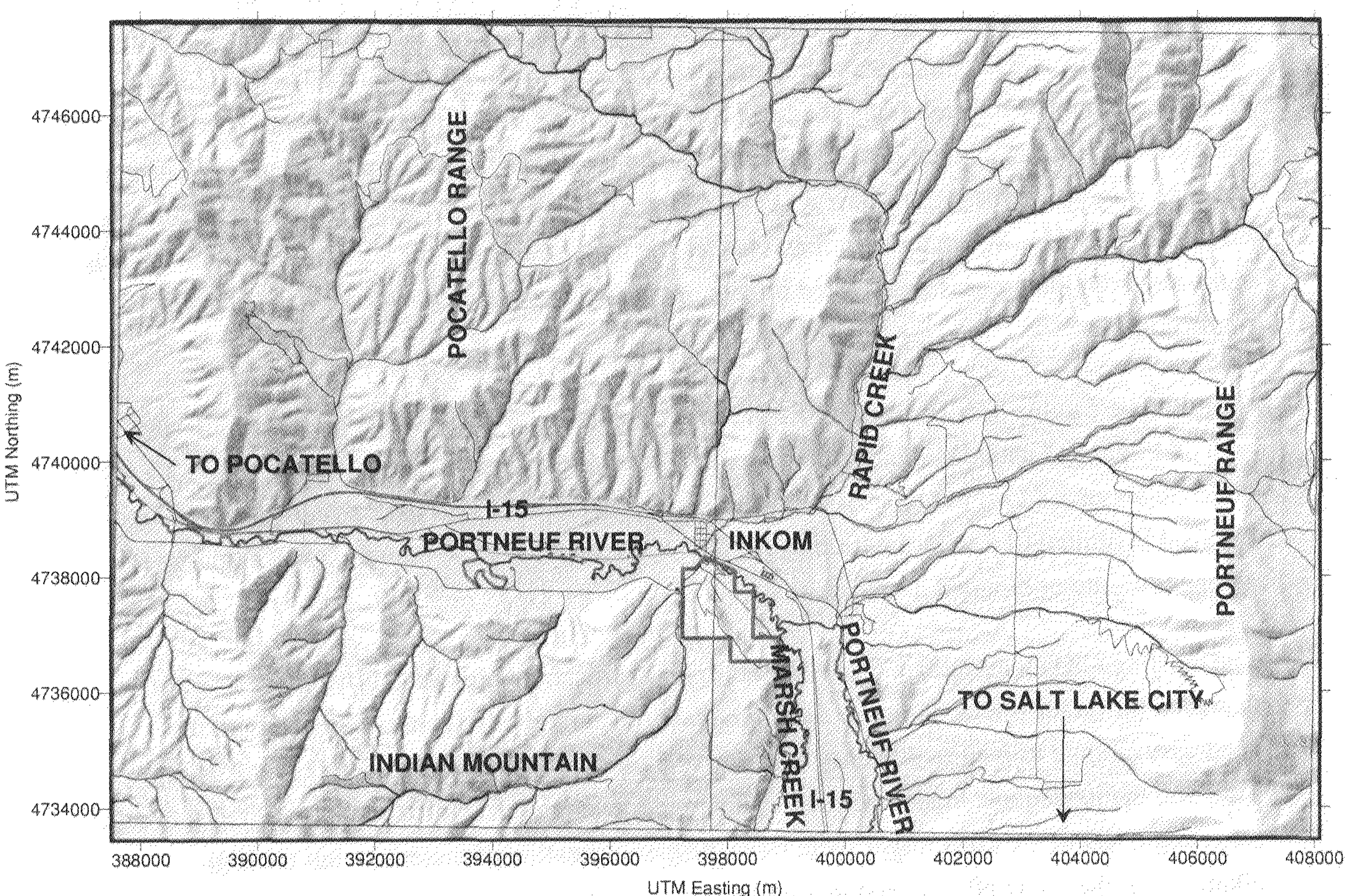


Figure 1. Vicinity of Ash Grove Facility

Air collection systems that feed the baghouses capture the majority of dust produced by process sources. There are smaller quantities of dust produced by the process sources that are not captured by the air handling systems and escape control by the baghouses. There are also sources of dust at the facility that do not presently have an air capture system and are not controlled by any of the baghouses. Both of these types of emissions are considered fugitive dust and are controlled by applying water sprays, road watering, enclosures (where pratical), and best management practices.

2.2 DESCRIPTION OF THE PROPOSAL

Ash Grove employs two electrostatic precipitators (ESPs) to control particulate matter emissions from its two cement kilns. The dust that is collected by the ESPs is referred to as cement kiln dust or "CKD." CKD contains a high percentage of oxides of potassium (K_2O) and sodium (Na_2O), commonly referred to as alkalies. The alkalies are impurities and not only have a deleterious effect on cement quality but can pose considerable operating problems. The curre... practice is to return the CKD to the process via the kiln feed systems when the kilns can tolerate additional alkalies. When the kiln feed reaches the upper threshold for alkali content, the CKD is removed from the process and wasted on-site or trucked to customers who use it in various applications.

Condition 8.7 in the Tier I permit limits the active cement kiln dust storage pile to a footprint area of 1 acre and an annual landfilling rate of 4,500 tons per year. Together, kilns 1 and 2 generate about 2.8 tons per hour of CKD per hour, or about 24,528 tons per year. Thus, on-site disposal is limited to a small fraction of the CKD generated, and the remaining CKD must be shipped off-site or blended into the kilns.

The existing CKD loading facility is limited to small trucks (approximately 10 ton). It is not designed for larger trucks nor can it accommodate rail cars. It also is not designed with the necessary storage to facilitate loading successive bulk containers. Together, the land filling limit and the inadequate loadout facility encourage recycling CKD into the kilns. On the surface, recycling CKD to the kilns might seem like a proper utilization of materials, but the high alkalinity of the CKD affects product quality and increases energy consumption in the kilns.

Ash Grove proposes to upgrade its current CKD material handling equipment for loading enclosed railcars and semi-trucks. CKD has become a valued product and opportunities for marketing CKD in the regional area look promising.

The following sections describe the existing and proposed CKD handling systems. In essence, Ash Grove proposes to eliminate the leach system that is currently used to prepare CKD for recycling it back to the kilns and install a pneumatic conveying system with enclosed CKD storage equipped with fabric filter control devices. The net result will be an improved CKD handling process with less fugitive dust and a more efficient and reliable loadout system.

Existing CKD Handling System

Appendix A contains a process flow diagram of the existing system. As illustrated in Figure A-1, a reversing screw (the "A screw") at the bottom of the ESP hoppers transports CKD either to dust bunkers (located adjacent to each ESP) or, through a series of screws and an elevator to one of three alternative disposal points:

(1) Leaching

Leaching provides an option to recycle CKD by re-introducing it to the kiln process as raw meal (kiln feed). CKD is conveyed from the ESP dust hoppers to a leach tank, where the water soluble alkalies (potassium and sulfate compounds) are "leached" from the CKD and separated from the solids by an overflow weir. This potassium sulfate solution is pumped to storage lagoons in the limestone quarry area. The low alkali solids in the tank, or underflow, forms a sludge, which is removed from the bottom of the leach tank and pumped to the raw mill (or kiln feed basin) where it is combined with the raw meal for the kilns.

This potassium sulfate solution historically has been pumped from the lagoon into bulk tank trucks and sold as fertilizer. Due to economics involving transportation, it has been some tim since the last sale.

(2) Turbulating

A second option is to convey CKD to a turbulator (paddle mixer). The turbulator is utilized to thoroughly mix water with the CKD to water content in the range of 15 – 20%. Wetted CKD substantially reduces dust emissions when it is loaded into trucks. The wetted CKD is used by the county landfill as daily cover or placed in the on-site storage pile.

3) Trucking

CKD sold to customers is emptied from a screw conveyor directly into a bulk truck. With this option, water is not mixed with CKD. Because bulk trucks are difficult to position beneath this screw for loading and they interfere with plant traffic due to the confined area around the screw conveyor, this option is seldom used.

Proposed CKD Handling System

Figure A-2 in Appendix A provides a process flow diagram illustrating the proposed changes in the CKD handling system. While the new system provides interim storage silos and new pneumatic conveyance systems, the only substantive changes are the elimination of the leach system and improvements in dust control.

A rotary feeder and a pneumatic conveying pump will be installed on each kiln system at the end of the A screw. Both pumping systems (Kiln 1 and Kiln 2) will convey CKD to the existing cement silo 1 (hereafter to be renamed CKD silo 1). Silo 1 is currently used to store cement, but it will be isolated from the cement-related process system to prevent cross contamination and used exclusively for CKD storage. Silo 1 will be equipped with a new bin vent rated at 2,400 acfm.

A pneumatic conveying system will be installed to extract the CKD from silo 1 and convey the material to a new loadout silo (to be designated CKD silo 2). Silo 2 will be equipped with a bin vent to reduce emissions when air is displaced from the silo during filling. Although the bin vent on silo 2 is rated for 2,400 acfm, the blower that conveys CKD from silo 1 will have a capacity of 1,680 acfm, so emissions from this transfer may be estimated by assuming a 1,680 cfm discharge rate. Ash Grove will install piping that allows the option of blending cement from (cement) silo 6 with CKD (from CKD silo 1) and conveying the blended product to the new loadout silo. The 1,680 acfm blower will carry CKD alone or the blend of CKD and cement.

The new loadout silo (CKD silo 2) will be located in an area accessible by railcars and semi-trucks (see Figure A-3 of Appendix A). With the improvement in bulk loading capabilities, Ash Grove will be able to pursue additional markets for CKD. CKD silo 2 will provide local storage of CKD or CKD blended with cement. The silo is sized to provide an adequate amount of product for efficient loading into rail cars or trucks. The loadout equipment will provide two options for loading railcars or trucks:

1) Loading of dry CKD: A loadout spout to load rail cars or trucks in dry bulk fashion. This spout will have an internal dust collection system that will vent to atmosphere. The dust collection system is rated at 1,250 acfm.

2) Loading of moisture conditioned CKD: A "DustMaster" (wetting) system to allow Ash Grove to load the wetted CKD (15-20% moisture) into a truck. This is a batch system with a 40 ton per hour capacity. The Dustmaster weighs the CKD then adds the appropriate quantity of water to effectively control fugitive dust emissions during

loading, hauling, and unloading operations. The wetted CKD may be shipped off site or stored on-site.

Ash Grove also requests the flexibility to landfill 100% of the annual CKD generation in the storage pile located near the limestone quarry. This would require elimination of the current Tier I limits in sections 8.7 and 16.5 or its revision to allow disposal of up to 24,528 tons per year (dry basis) and a 2 acre pile size.

Ash Grove proposes to eliminate the leach tank and the leachate pump used to pump the potassium sulfate solution to the lagoons. However, it will maintain the existing CKD conveying equipment and turbulator in case it is needed as a back-up system. The dust bunkers will also remain, because they provide an immediate outlet for the CKD in the event of a mechanical problem with the CKD conveyance system. The dust bunkers are expected to only be used for emergency, malfunction, or upset conditions.

Summary

The new CKD handling system will allow complete flexibility in disposing of CKD:

- 100% of the CKD may be wetted and stored on-site;
- 100% of the CKD may be wetted and shipped off-site;
- 100% of the CKD may be loaded and shipped dry via rail and/or truck;
- up to approximate 50% cement (by weight) may be blended with the dry CKD and loaded/shipped via rail or truck; or
- a combination of all of the above.

2.3 EMISSION IMPLICATONS OF THE PROPOSAL

Emission sources associated with the new equipment will include bin vents on CKD silos 1 and 2, the loadout spout dust collector, and fugitives associated with the loadout area. There will also be an increase in fugitive emissions associated with the larger CKD storage pile and the transfer of CKD to the storage pile. Past and projected quantities of CKD placed in the storage pile are summarized in Table 1. The highest CKD quantity in recent years occurred in 2003 and 2004, which were chosen as the baseline years. Note that the 20,000 ton difference between baseline and future throughput values reflects CKD diverted from the leach system to the pneumatic system, not an increase in CKD production.

Table 1. Baseline and Proposed Quantity of CKD

Baseline			Proposed
2003	2004	Average	
4,499	4,351	4,425	24,528

The CKD silo 1, CKD silo 2, and the loadout spout each have a dust collector (baghouse) with an emission factor of 0.01 grains per cubic foot. All equipment will operate for 8,760 hours per year.

Emissions will be controlled by a dust collector that is integral to the loadout spout when CKD is loaded into trucks or rail cars under CKD silo 2. Although most of the emissions are controlled by the dust collector, some fugitive TSP and PM_{10} emissions are released. Emission rates for the fugitives were calculated using AP-42 Section 11.12 emission factors for mixer loading.

The calculations of fugitive emissions from roads are based on the number of trips each truck takes on each segment of road. The number of trips is determined from the material throughput in tons per year and the truck capacity in tons. With a potential increase in CKD to the storage pile, there is an expected increase of truck traffic and road emissions. Storage pile transfer emission rates are also based on throughput of CKD. The emissions for roads were calculated using AP-42 emission factors for unpaved roads. The emission calculations for the pile are based on the same equations that were used to estimate emissions for the 2002 Tier I permit.

Table 2 contains a summary of the emissions associated with the CKD project. Detailed emission calculations are provided in Appendix B.

Table 2. Total Projected Emissions from CKD Handling

	TSP		PM10	
Source	lb/hr	ton/yr	lb/hr	ton/yr
Process Fugitives	1.99	0.61	0.56	0.17
Baghouses	0.46	2.00	0.46	2.00
Road Fugitives	--	0.59	--	0.15
Pile Fugitives	--	0.97	--	0.47
TOTAL	**2.45**	**4.17**	**1.01**	**2.79**

Baseline actual emissions were calculated using the average tons of CKD transferred to the on-site storage pile in 2003 and 2004. In keeping with the standard practice of not including emissions from equipment malfunctions, emissions associated with a breakdown of the CKD conveyance equipment where CKD is transported to a bunker and loaded out with a front-end loader were not included in the baseline emissions. As a result, baseline emissions may be slightly underestimated. The total emissions increase associated with the project is summarized in Table 3 below. Detailed emission calculations are provided in Appendix B.

Table 3. Total Emissions Increase

Units in tons per year.

Pollutant	TSP	PM10
Baseline Emissions (Two Year Average)	1.25	0.45
Projected Emissions	4.17	2.79
Net Emissions Increase	2.92	2.35

This project does not constitute a physical change or change in the method of operation of the kilns because the kilns have always been capable of operating without CKD input. Furthermore, there is no expectation that eliminating use of the leach system will decrease kiln downtime. Ash Grove is not requesting and does not expect any changes to clinker production or emissions from the kilns as a result of this project for the following reasons:

- Although in the last couple of years clinker production has been lower, historical operations data shows the No. 1 kiln was able to achieve the maximum hourly clinker production rate of 15.4 tons clinker per hour and No. 2 kiln nearly achieved the maximum clinker production rate (19.2 tons clinker per hour versus the 19.4 tons per hour limit) with CKD input. Therefore, since we are not asking nor expecting to increase clinker production above the historical production rates, removing CKD will not de-bottleneck the kilns.

- A recent source test conducted when kiln feed did not include CKD did not show a statistically significant increase in emissions when compared to past source tests as determined using the "Student's *t* test".[1]

- Ash Grove expects to run the kilns at a lower temperature because of the lower alkali content of the kiln feed. This means less fuel will be combusted and emissions of combustion related pollutants such as NO_X and CO will decrease.

We conclude that there will be no increase in clinker production or emissions from the kilns attributable to the CKD project. Therefore, emissions from the kilns have not been included in this application.

[1] 40 CFR 60 Appendix C, Determination of Emission Rate Change

2.4 TOXIC AIR POLLUTANTS

Portland cement is listed as a Toxic Air Pollutant (TAP) in IDAPA 58.01.01.585. An evaluation of TAPs is required with new or modified industrial sources of Portland cement. An evaluation of TAPs is not required because this project does not involve the construction of a new or modification of an existing emissions source of Portland cement. The only new and modified sources related to the project emit CKD as PM or PM_{10}, which differs from Portland cement in size and chemistry.

3.0 REGULATORY REQUIREMENTS

This section discusses air quality regulations that apply to the Inkom plant and details why other federal and state regulatory programs are not applicable.

3.1 FEDERAL REQUIREMENTS

3.1.1 Prevention of Significant Deterioration

The Inkom plant is a major source with respect to federal PSD rules because potential emissions of at least one pollutant are greater than 100 tons per year. The PSD applicability threshold of 100 tpy is used because Portland cement plants are one of the "named 28" industrial categories with a lower applicability threshold. Since the Inkom plant is considered a PSD major source, PSD applicability is based on each applicable pollutant's significant emission rate (SER). The only two SERs applicable in this case are the total suspended particulate matter (TSP) SER of 25 tpy and the PM10 SER of 15 tpy.

As detailed within Section 2.3, the PM emissions increase resulting from the proposed CKD handling system would about 3 ton per year; the PM10 emissions increase would be just over 2 tons per year. Because increases in PM10 and PM emissions are less than the applicable SERs, the changes do not constitute a major modification and the proposal is not subject to the PSD permit process.

3.1.2 New Source Performance Standards

EPA has established New Source Performance Standards (NSPS) for new, modified, or reconstructed facilities and source categories such as Portland cement plants (NSPS, Subpart F). NSPS standards are codified in 40 CFR Part 60. NSPS define a modification as "*any physical change in, or change in the method of operation of, an existing facility which increases the amount of any air pollutant (to which a standard applies) emitted into the atmosphere by that facility or which results in the emission of any air pollutant (to which a standard applies) into the atmosphere not previously emitted.*

Subpart F applies to the following affected facilities in Portland cement plants: Kiln, clinker cooler, raw mill system, finish mill system, raw mill dryer, raw material storage, clinker storage, finished product storage, conveyor transfer points, bagging and bulk loading and unloading systems. Although NSPS rules do not specifically identify CKD or CKD handling operations, Ash Grove has taken a conservative approach and decided the NSPS rules apply to CKD because the CKD is generated from the kilns. Therefore, the CKD handling system would be considered an affected facility under Subpart F. The only substantive requirement that applies is an opacity limit of 10 percent. The existing material handling processes are already subject to these same NSPS requirements, and changes in throughput limits would not affect this applicability.

3.1.3 NESHAPS/MACT

Maximum Achievable Control Technology (MACT) standards are industry-specific technology-based standards designed to reduce HAP emissions. These standards can require facility owners/operators to meet emission limits, install emission control technologies, monitor emissions and/or operating parameters, and use specified work practices. In addition, the standards typically include recordkeeping and reporting provisions. MACT standards are codified in 40 CFR Part 63. Currently, the Inkom plant is an area source under the MACT standards for Portland cement plants.

This project does not affect the current MACT applicability or applicable standards since this project does not cause HAPs to be emitted in excess of 10 tons per year for any single HAP or 25 tons per year for combined HAPs.

3.1.4 Tier I Air Operating Permit

The Inkom plant operates under the provisions of a Tier I Air Operating Permit issued by DEQ. Ash Grove is requesting that existing limits on CKD pile size, stockpile rate, and annual quantity stockpiled be increased or rescinded. Per IDAPA 58.01.01.382.01, changing the Tier I permit to accommodate this increase requires a "significant permit modification" to the current Tier I permit. Ash Grove requests that DEQ process any new conditions associated with the CKI handling system as a Significant Permit Modification, and that DEQ revise the Tier I permi concurrently with the PTC (i.e., on a parallel approval path). The text of this application provides sufficient information to meet the application requirements of IDAPA 58.01.01.314.

Ash Grove requests that conditions 8.7 and 16.5 in the Tier I permit be eliminated or changed. If changed, the text should be revised to read:

Condition 8.7. The active cement kiln dust storage pile shall be limited to a footprint area of ~~1~~ 2 acres and an annual material throughput of ~~4,500~~ 24,528 T/yr.

Condition 16.5. Cement kiln dust waste storage pile shall receive no more than ~~6~~40 tons of CKD per hour, and ~~4,575~~ 24,528 tons per year.

3.2 STATE REQUIREMENTS

3.2.1 Permit to Construct

The addition of new equipment and increasing the amount of CKD stored on-site will result in a change in emissions of particulate matter. The potential emissions related to this project are greater than the "Below Regulatory Concern" levels detailed within IDAPA 58.01.01.221.01, and the modification requires a PTC permit.

DEQ's standard PTC form Section 1 is provided in Appendix C. This document provides more detail than is possible using Sections 2 and 3 of the standard forms, so those forms are not included.

3.2.2 Tier II Permit

The Inkom plant also operates under the provisions of a Tier II Operating Permit issued by DEQ in November 2002. Analogous to the request to revise the Tier I permit, Ash Grove requests that existing limits on the CKD pile size, stockpile rate, and annual quantity stockpiled be increased or rescinded. Specifically, Ash Grove requests that condition 4.1 of Section 15 of the Tier II permit be eliminated or changed. If changed, the text should be revised to read:

Condition 4.1. CKD waste storage shall receive no more than ~~six~~ forty tons of CKD per hour and ~~4,575~~ 24,528 tons of CKD per year.

There is no analogous restriction on pile size in the Tier II permit. However, the Tier II permit (Section 15, Condition 2.2) requires compliance with fugitive dust mass emission limits listed in Appendix B. Consistent with the request in the 2002 Tier II permit application, Ash Grove requests that the fugitive dust mass emission limits and any related recordkeeping and reporting requirements be rescinded.

3.2.2 IDAPA 58.01.01 General Provisions

The same general provisions that apply to existing transfer points would apply to the new transfer points. IDAPA 58.01.01.625 limits visible emissions for a period or periods aggregating more than three (3) minutes in any sixty (60) minute period to 20 percent opacity.

Process weight limits on PM emissions (IDAPA 58.01.01.700-703) also apply.

4.0 AMBIENT AIR QUALITY ASSESSMENT

Ash Grove submitted a Tier II permit application in December 2002 that included detailed modeling of plant emissions. Ash Grove responded to several DEQ requests for additional information related to emissions and the modeling analysis, most recently in September 2004.

In May 2005, Ash Grove submitted a PTC application for a clinker unloading operation. That application included a dispersion modeling analysis that used the same methodology and assumptions utilized in the modeling analysis submitted to DEQ in 2004.

To satisfy the requirements of IDAPA 58.01.01.203.02 and 03, Geomatrix assessed emissions associated with the CKD handling project along with all other (Ash Grove) sources of particulate matter by comparing predictions from the ISCST3 Prime dispersion model with relevant regulatory criteria. This discussion will not repeat all of the modeling methodology details because they are identical to the past modeling analysis, which was addressed in the September 2004 submittal. Rather, this discussion will focus on the modifications made to the dispersion analysis to account for the changes to the plant discussed in Section 2.0 of this PTC application.

The previous modeling studies of the Inkom plant used the Industrial Source Complex Model Version 3 – Prime (ISC3-prime) air quality model. The same air quality model has been used in the current investigation. Previous modeling studies have used meteorological data collected in 1995 by the IDEQ at a location in Inkom to the east of the Ash Grove plant. In addition, a comprehensive series of receptors was developed in the previous modeling analysis, and in particular, receptors for the public road to the south of the plant were determined by actual GPS measurements taken by the modeling team at the Inkom plant. Finally, the previous air quality modeling studies for the Inkom plant addressed a variety of different air pollutants, but PM10 is the only air pollutant at issue for the CKD Project.

The current air quality modeling analysis used the same methods, data and assumptions as was used previously, with the following changes:

- The previous CKD handling emission sources were removed. These emission sources were represented by a small volume source near the kilns. The model designation for this source was KILND.

- A new volume source was added to represent the new proposed CKD loadout. This source is located on the rail line, immediately east of the main plant. The model designation for this source is KILND2. Details on this source are as follows:
    - Source Type: Volume source
    - Source Location (UTM coordinates): 397853.6, 4738088.9
    - Source elevation: 1392.0 meters
    - Release height: 3.4 meter
    - Initial sigma-y: 1.4 meters (= 6 meters/4.3)
    - Initial sigma-z: 9.5 meters (= 20 meters/2.15)
    - Emission rate for PM10: (see section 2.0)

- Three new point sources were added to represent the two bin vents on the CKD silos and the dust collector on the CKD loadout spout. The model designations for these sources are BH12, BH13, and BH14. Stack parameters for these sources are summarized in Table 5.

- The emission rate for the fugitive emissions from the storage piles (designated STORAGE) were updated with the proposed increase in pile size and throughput. Because only wet CKD will be transferred and stored in the pile, the moisture content was increased from 1% to 15%.

- The emissions calculations for paved and unpaved roads were updated using the most recent AP-42 emission factors from Section 13.2.2 dated December 2003. CKD throughput was updated to the proposed throughput of 24,528 tons per year, which is lower than the 94,554 tons per year throughput used in previous emissions calculations and modeling. Also, the truck weights for empty and loaded conditions were increased to 11 and 21 tons, respectively. Roads affected by the CKD throughput are represented by volume sources R68 – R75, R92 – R101, and R118 – R130.

Table 5. Point Source Stack Parameters.

Source	Stack ID	UTM Coordinate Northing	UTM Coordinate Easting	Elevation (m)	Stack Diameter (m)	Exit Velocity (m/sec)	Stack Height. (m)	Exit Temp. (Deg K)
CKD SILO 1	BH12	397748.7	4738137.9	1382.0	0.29	16.90	22.86	293.15
CKD SILO 2	BH13	397852.6	4738089.4	1392.0	0.29	11.83	23.32	293.15
CKD TRUCK LOADOUT	BH14	397854.7	4738088.5	1392.0	0.15	32.34	7.62	293.15

The ISC3-prime model was run for the single year of meteorological data. Two runs were made: one for the short-term emission rate and one for the long-term emission rate. A compact disc included in Appendix D includes the complete modeling files for the current analysis. The results of the modeling are as follows and are summarized in Table 6:

- The maximum second-high 24-hour average concentration at any receptor for the short-term modeling was 94.5 micrograms per cubic meter ($\mu g/m^3$), and was located at a receptor west of the main plant on the public road that crosses the plant property. Previous modeling runs have shown peak impacts in the same area. The coordinates of the receptor where the peak concentrations were calculated were: 397531.3, 4738178.0. When added to the background concentration of 48 $\mu g/m^3$ for 24-hour PM10 concentrations, the total is 142.5 $\mu g/m^3$, below the ambient standard of 150 $\mu g/m^3$
- The peak annual average concentration at any receptor from the long-term modeling was 23.0 $\mu g/m^3$, located on the same road as the peak 24-hour concentration, but to the east of the 24-hour concentration maximum. The UTM coordinates of the peak receptor for the annual analysis were 397675.0, 4738066.5. When added to the background concentration of 26 $\mu g/m^3$, the total is 49.0 $\mu g/m^3$, below the ambient standard for of 50 $\mu g/m^3$.

Table 6. Criteria Pollutant Modeling Results.

Pollutant	Averaging Period	Plant Contribution ($\mu g/m^3$)	Background Concentration ($\mu g/m^3$)[a]	Maximum Ambient Concentration ($\mu g/m^3$)	Ambient Standard ($\mu g/m^3$)
PM_{10}	24-Hour	94.5	48	142.5	150
	Annual	23.0	26	49.0	50

The modeling results for the current analysis have decreased from previous modeling results for PM10. This decrease is largely due to the update of the emissions calculations of fugitive dust from roads as explained under the last bullet on page 14. Furthermore, previous modeling had a higher CKD throughput on roads (increased trips) than proposed in this permit application. The conclusion of the air quality modeling analysis is that the proposed CKD handling system results in no significant change in the predicted PM10 concentrations, and no change in the ambient air quality standard compliance status.

APPENDIX A

Process Flow Diagram and Site Plan

Figure A-4. Detail of Proposed CKD Loadout Station

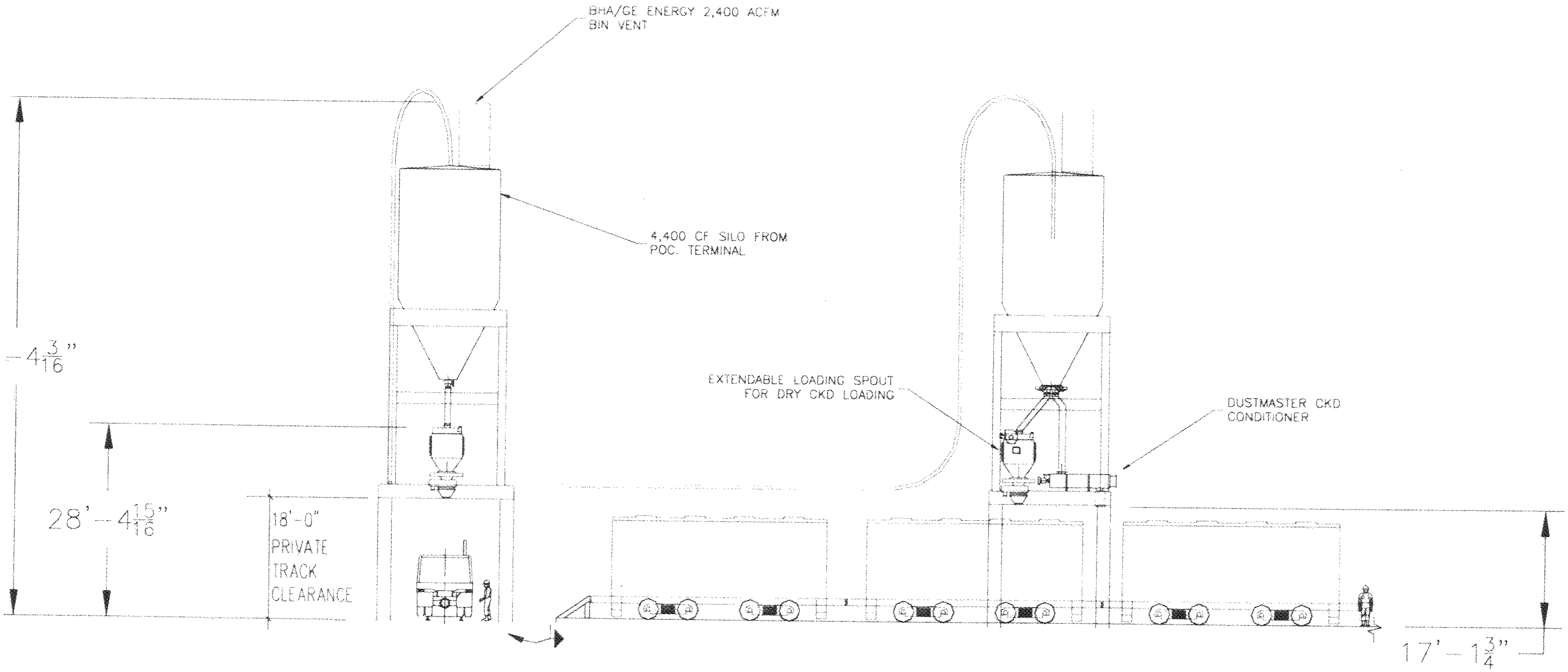


Figure A-3. Site Plan Showing Proposed CKD Loadout Station

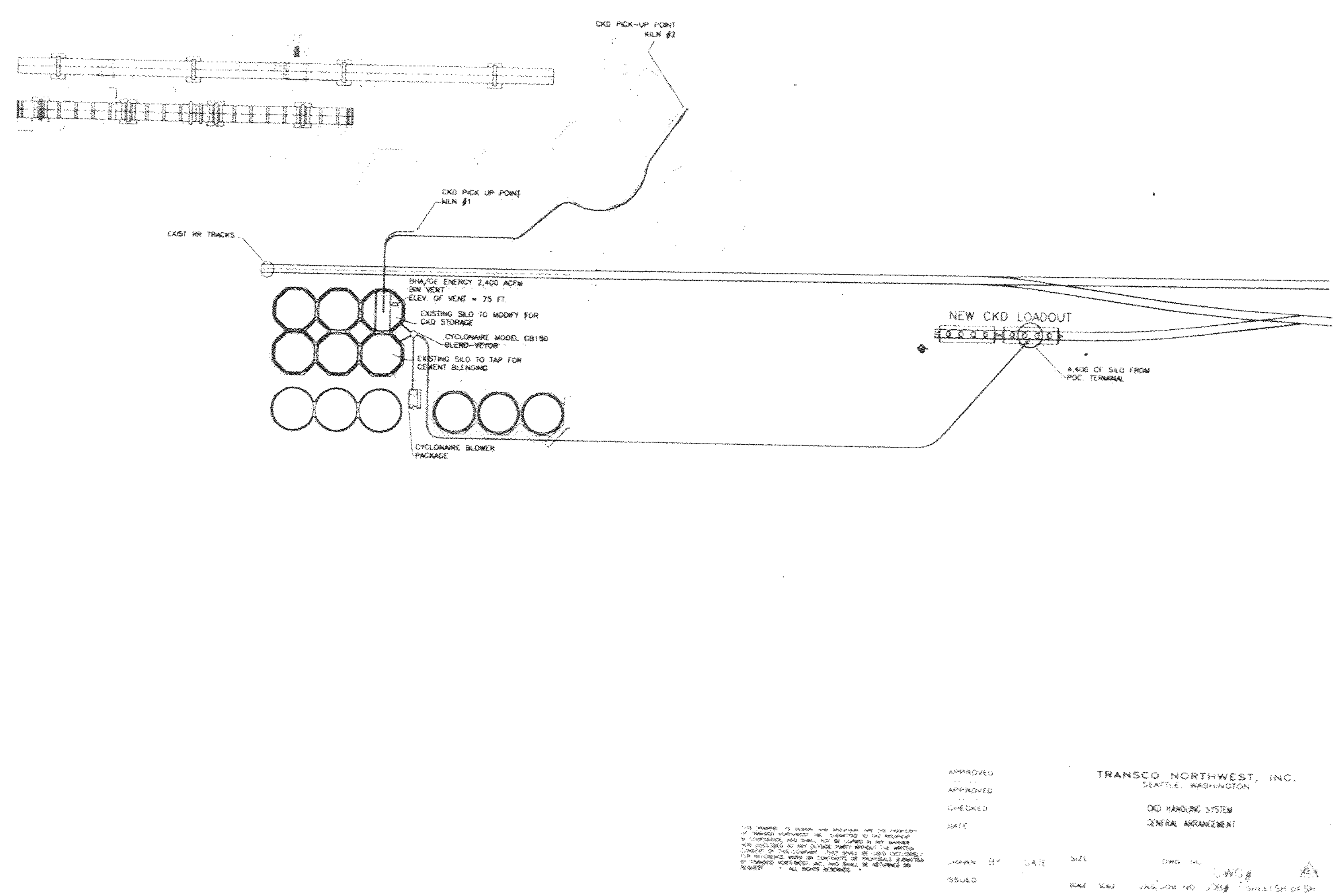


Figure A-2. Process Flow Diagram of Proposed CKD Handling System

NUMBER	1	2	3	4	5	6	7	8	9	10	11
EQUIPMENT NAME	NO. 1 CKD BLOWER	NO. 2 CKD BLOWER	CKD SILO #1	BIN VENT	NO. 6 CEMENT SILO	NO. 3 CKD BLOWER	CONVEY/BLENDER	BIN VENT	CKD SILO #2	LOADOUT SPOUT	CKD MIXER
MANUFACTURE	CYCLONAIRE CORP.	CYCLONAIRE CORP.	CUSTOM	GE ENERGY (BHA)	CUSTOM	CYCLONAIRE CORP.	CYCLONAIRE CORP.	GE ENERGY (BHA)	ASH GROVE	TBD	DUSTMASTER
DESIGN CAPACITY	400 SCFM @ 5 PSIG	400 SCFM @ 8 PSIG	23,400 CU. FT.	2,400 ACFM	23,400 CU. FT.	1600 SCFM @ 15 PSIG	150 CU. FT CAP., 1790 SCFM	2,400 ACFM	4,400 CU. FT.	TBD	40 TPH
MOTOR	15 HP, 230/460V	25 HP, 230/460V	NA	NA	NA	200 HP, 230/460V	230/460V	NA	NA	NA	NA
MODEL NUMBER	NA	NA	NA	NA	NA	NA	CB-150	NA	NA	NA	NA
SERIAL NUMBER	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

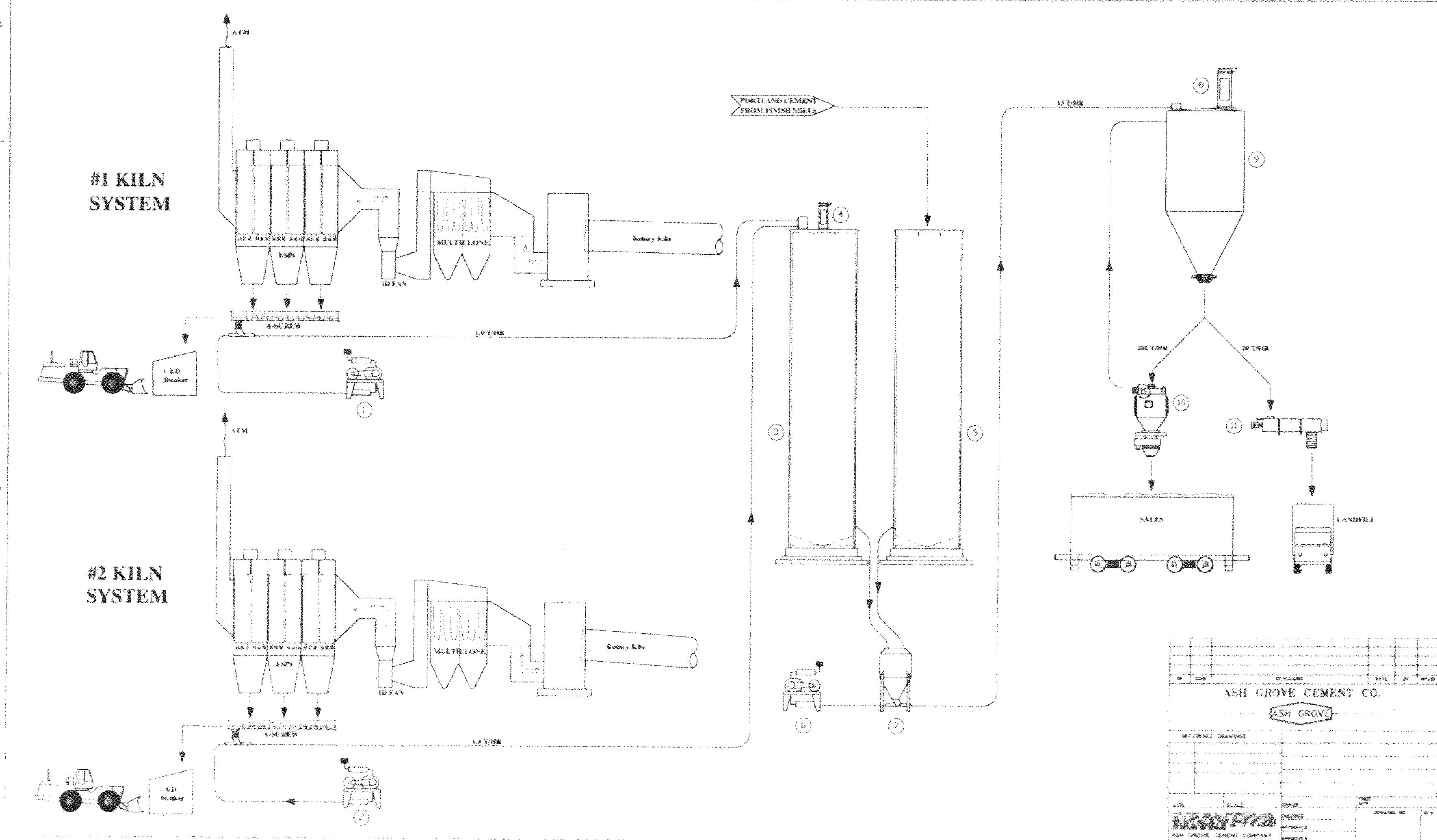
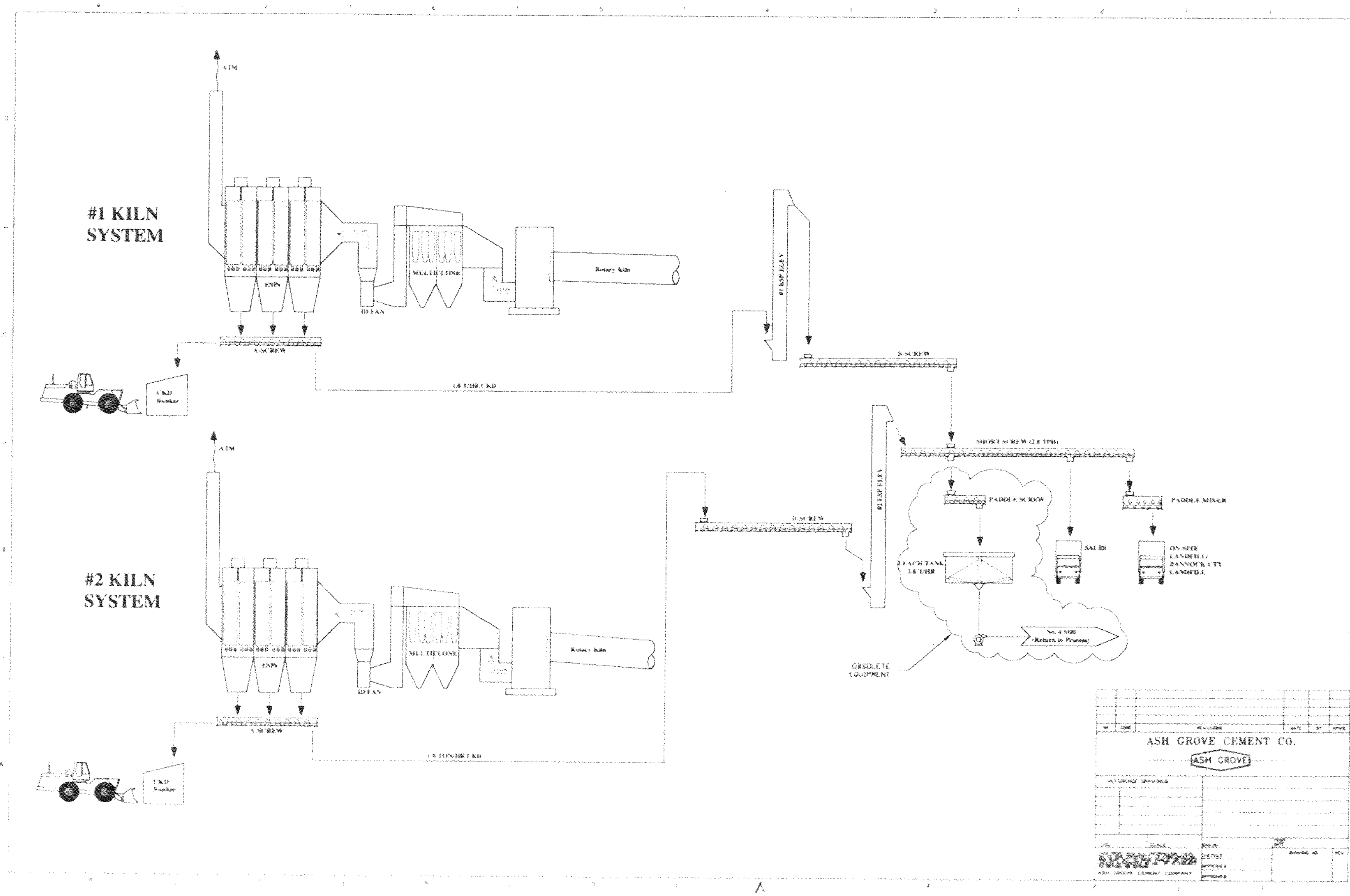


Figure A-1. Process Flow Diagram of Current CKD Handling System



APPENDIX B

Emissions Calculations

PROCESS FUGITIVES

Projected Actual Emissions

SOURCE DESCRIPTION		THROUGHPUT			EMISSION FACTORS[1]		CONTROL			EMISSIONS			
		HRS	MAX.		TSP	PM10				TSP		PM10	
NAME FROM	NAME TO	/YR	TON/H	TON/YR	LB/TON	LB/TON	MOIST.	CAPT.	BUILD.	LB/HR	T/YR	LB/HR	T/YR
Emissions associated with all CKD disposal options													
K1 ESP	A SCREW	8,760	1.0	8,760	0.995	0.278	0%	0%	100%	0.000	0.000	0.000	0.000
K2 ESP	A SCREW	8,760	1.8	15,768	0.995	0.278	0%	0%	100%	0.000	0.000	0.000	0.000
CKD Disposal Option 1: Turbulator to truck or railcar wet and haul away													
CKD SILO 2	TURBULATOR	8,760	40	24,528	0.995	0.278	0%	0%	100%	0.000	0.000	0.000	0.000
TURBULATOR	TRUCK OR RAILCAR	8,760	40	24,528	0.995	0.278	85%	95%	0%	0.299	0.092	0.083	0.026
Total Option 1										0.299	0.092	0.083	0.026
CKD Disposal Option 2: Dump to truck or railcar dry and haul away													
CKD SILO 2	SPOUT	8,760	40	24,528	0.995	0.278	0%	0%	100%	0.000	0.000	0.000	0.000
SPOUT	TRUCK OR RAILCAR	8,760	40	24,528	0.995	0.278	0%	95%	0%	1.990	0.610	0.556	0.170
Total Option 2										1.990	0.610	0.556	0.170
CKD Disposal Option 3: Turbulator to truck wet and stockpile in quarry													
CKD SILO 2	TURBULATOR	8,760	40	24,528	0.995	0.278	0%	0%	100%	0.000	0.000	0.000	0.000
TURBULATOR	TRUCK	8,760	40	24,528	0.995	0.278	85%	95%	0%	0.299	0.092	0.083	0.026
Total Option 3										0.299	0.092	0.083	0.026
Maximum disposal option:										**1.990**	**0.610**	**0.556**	**0.170**
TOTAL										**1.99**	**0.61**	**0.56**	**0.17**

Baseline Actual Emissions

SOURCE DESCRIPTION		THROUGHPUT			EMISSION FACTORS[1]		CONTROL			EMISSIONS			
		HRS	MAX.		TSP	PM10				TSP		PM10	
NAME FROM	NAME TO	/YR	TON/H	TON/YR	LB/TON	LB/TON	MOIST.	CAPT.	BUILD.	LB/HR	T/YR	LB/HR	T/YR
K1 ESP	SCREW	1,949	1.0	1,949	0.995	0.278	0%	0%	100%	0.00	0.00	0.00	0.00
SCREW	ELEVATOR	1,949	1.0	1,949	0.995	0.278	0%	0%	100%	0.00	0.00	0.00	0.00
ELEVATOR	SCREW	1,949	1.0	1,949	0.995	0.278	0%	0%	100%	0.00	0.00	0.00	0.00
SCREW	SCREW	1,949	1.0	1,949	0.995	0.278	0%	0%	100%	0.00	0.00	0.00	0.00
SCREW	TURBULATOR	1,949	1.0	1,949	0.995	0.278	0%	0%	100%	0.00	0.00	0.00	0.00
TURBULATOR	TRUCK	1,949	1.0	1,949	0.995	0.278	70%	0%	0%	0.30	0.29	0.08	0.08
K2 ESP	SCREW	1,376	1.8	2,476	0.995	0.278	0%	0%	100%	0.00	0.00	0.00	0.00
SCREW	SCREW	1,376	1.8	2,476	0.995	0.278	0%	0%	100%	0.00	0.00	0.00	0.00
SCREW	ELEVATOR	1,376	1.8	2,476	0.995	0.278	0%	0%	100%	0.00	0.00	0.00	0.00
ELEVATOR	SCREW	1,376	1.8	2,476	0.995	0.278	0%	0%	100%	0.00	0.00	0.00	0.00
SCREW	TURBULATOR	1,376	1.8	2,476	0.995	0.278	0%	0%	100%	0.00	0.00	0.00	0.00
TURBULATOR	TRUCK	1,376	1.8	2,476	0.995	0.278	70%	0%	0%	0.54	0.37	0.15	0.10
TOTAL										**0.84**	**0.66**	**0.23**	**0.18**

1. AP-42 Table 11.12-2, June 2006, Uncontrolled Truck Loading

BAGHOUSES

Projected Actual Emissions

ID No.	Area served	Flow Rate acfm	Temperature deg. F	Emission Factor PM gr/dscf	Emission Factor PM10 gr/dscf	Operating Hours hrs/yr	Emissions PM lb/hr	Emissions PM ton/yr	Emissions PM_{10} lb/hr	Emissions PM_{10} ton/yr
B12	CKD SILO 1 (bin vent)	2,400	68	0.010	0.010	8,760	0.21	0.90	0.21	0.90
B13	CKD SILO 2 (bin vent)	1,680	68	0.010	0.010	8,760	0.14	0.63	0.14	0.63
B14	CKD TRUCK LOADOUT	1,250	68	0.010	0.010	8,760	0.11	0.47	0.11	0.47
TOTAL							**0.46**	**2.00**	**0.46**	**2.00**

UNPAVED ROADS

Projected Actual Emissions

Segment No.	Segment Length (mi)	Truck Trips Empty	Truck Trips Loaded	Empty Mileage (Mi/yr)	Loaded Mileage (Mi/yr)	Total Mileage (Mi/yr)	TSP Empty Emissions (T/yr)	TSP Loaded Emissions (T/yr)	TSP Total Emissions (T/yr)	PM-10 Empty Emissions (T/yr)	PM-10 Loaded Emissions (T/yr)	PM-10 Total Emissions (T/yr)
D	0.10	x	x	245	245	491	0.05	0.06	0.11	0.01	0.02	0.03
3P	0.20	x	x	491	491	981	0.10	0.13	0.22	0.02	0.03	0.06
CKD	0.10	x	x	245	245	491	0.05	0.06	0.11	0.01	0.02	0.03
3S	0.13	x	x	319	319	638	0.06	0.08	0.14	0.02	0.02	0.04
TOTAL									**0.59**			**0.15**

Baseline Actual Emissions

Segment No.	Segment Length (mi)	Truck Trips Empty	Truck Trips Loaded	Empty Mileage (Mi/yr)	Loaded Mileage (Mi/yr)	Total Mileage (Mi/yr)	TSP Empty Emissions (T/yr)	TSP Loaded Emissions (T/yr)	TSP Total Emissions (T/yr)	PM-10 Empty Emissions (T/yr)	PM-10 Loaded Emissions (T/yr)	PM-10 Total Emissions (T/yr)
D	0.10	x	x	44	44	89	0.01	0.01	0.02	0.00	0.00	0.01
3P	0.20	x	x	89	89	177	0.02	0.02	0.04	0.00	0.01	0.01
CKD	0.10	x	x	44	44	89	0.01	0.01	0.02	0.00	0.00	0.01
3S	0.13	x	x	58	58	115	0.01	0.01	0.03	0.00	0.00	0.01
TOTAL									**0.11**			**0.03**

Emission Factor Calculation

Truck Weights Empty (Tons)	Truck Weights Loaded (Tons)	Material Net (Tons)	Projected Material (T/yr)	Projected Material Trips (#/yr)	Baseline Material (T/yr)	Baseline Material Trips (#/yr)
11	21	10	24,528	2,453	4,425	443
Silt %	**Rain Days (year)**	**MgCL Water Control %**	**TSP Empty Trucks lb/VMT**	**TSP Loaded Trucks lb/VMT**	**PM-10 Empty Trucks lb/VMT**	**PM-10 Loaded Trucks lb/VMT**
5.5	90	90	0.39	0.52	0.10	0.14

Reference: AP-42 Section 13.2.2, Unpaved Roads, December 2003.

PILE

Projected Actual Emissions

Area	Pile Num.	Pile Area (Acres)	Material Throughput (T/yr)	TSP			PM_{10}			TSP Total Emissions	PM_{10} Total Emissions
				Transfer Factor (lb/Ton)	Transfer Emissions (T/yr)	Wind Emissions (T/yr)	Transfer Factor (lb/Ton)	Transfer Emissions (T/yr)	Wind Emissions (T/yr)	(T/yr)	(T/yr)
Quarry	7	2.00	24,528	0.00048	0.0059	0.96	0.00017	0.00	0.4675	0.97	0.47

Baseline Actual Emissions

Area	Pile Num.	Pile Area (Acres)	Material Throughput (T/yr)	TSP			PM_{10}			TSP Total Emissions	PM_{10} Total Emissions
				Transfer Factor (lb/Ton)	Transfer Emissions (T/yr)	Wind Emissions (T/yr)	Transfer Factor (lb/Ton)	Transfer Emissions (T/yr)	Wind Emissions (T/yr)	(T/yr)	(T/yr)
Quarry	7	1.00	4,425	0.00048	0.0011	0.48	0.00017	0.00	0.2338	0.48	0.23

Assumptions:
10.2 mph, Average Wind Speed
15 % Material Moisture
90 Rain Days per Year
3.5 lb TSP per acre per day, Wind Factor
1.7 lb PM10 per acre per day, Wind Factor
Assumed no wind erosion on rain days.

Ash Grove Cement Plant
Inkom, Idaho
Analysis of Kiln Emissions by Student t-Test (40 CFR 60, Appendix C)
For 2003 thru 2005 versus 2006 (future actuals)

Stack Test Results (EPA Method 5, including back half catches)

		Kiln 1				Kiln 1				Kiln 1				Kiln 1			
Run		1	2	3	AVE	1	2	3	AVE	1	2	3	AVE	1	2	3	AVE
Date		8/7/03	8/7/03	8/7/03		1/14/04	1/14/04	1/14/04		8/24/05	8/24/05	8/24/05		7/12/06	7/12/06	7/12/06	
Emission Rate Front Half	lb/hr	8.22	8.85	7.79	8.29	5.10	7.22	6.32	6.21	6.16	4.98	7.14	6.1	6.46	6.08	6.73	6.42
Emission Rate Back Half	lb/hr	0.23	0.08	0.16	0.16	1.36	2.40	1.53	1.76	4.76	4.75	4.55	4.69	3.19	3.35	2.96	3.17
Total Emissions	lb/hr	8.45	8.93	7.95	8.44	6.46	9.62	7.85	7.98	10.92	9.73	11.69	10.79	9.65	9.43	9.69	9.59

		Kiln 2				Kiln 2				Kiln 2				Kiln 2			
Run		1	2	3	AVE	1	2	3	AVE	2	3	4	AVE	2	3	4	AVE
Date		8/5/03	8/5/03	8/5/03		8/25/04	8/25/04	8/25/04		8/23/05	8/23/05	8/23/05		7/11/06	7/11/06	7/11/06	
Emission Rate Front Half	lb/hr	7.9	7.64	8.62	8.05	3.41	4.01	4.46	3.96	3.28	2.8	3.23	3.10	3.49	3.74	3.10	3.45
Emission Rate Back Half	lb/hr	0.21	0.11	0.19	0.17	0.22	0.2	0.18	0.2	0.68	0.36	0.17	0.40	0.42	1.79	1.88	1.37
Total Emissions	lb/hr	8.11	7.75	8.81	8.22	3.63	4.21	4.64	4.16	3.96	3.16	3.4	3.51	3.91	5.53	4.99	4.81

Student t-Test Results

	2003-2005 Avg. vs. 2006 Avg.							Statistical Results
	03-05 Avg	06 Avg	Sa^2	Sb^2	Sp	t	t'	Increase Significant, t>t' (yes/no)
Kiln 1	9.07	9.59	2.62	0.019	1.45	0.538	2.9	No
Kiln 2	5.30	4.81	5.08	0.677	2.05	-0.355	1.81	No, 2006 emissions are less than 2003 - 2005 average

Note: Stack testing conducted in July 2006 was conducted when CKD was out of the kiln feed.
Thus, the testing represents kiln operations after the CKD project.

APPENDIX C

Permit to Construct Form

SECTION 1: GENERAL INFORMATION

COMPANY & DIVISION NAME	ASH GROVE CEMENT COMPANY
STREET ADDRESS OR P.O. BOX	230 CEMENT ROAD
CITY	INKOM
STATE	IDAHO
ZIP	83245
PERSON TO CONTACT	RON SMITH
TITLE	PLANT MANAGER
PHONE NUMBER	(208) 775-3351, EXT. 12
EXACT PLANT LOCATION	230 CEMENT ROAD, INKOM, IDAHO
GENERAL NATURE OF BUSINESS	CEMENT MANUFACTURING
NUMBER OF FULL-TIME EMPLOYEES	
PROPERTY AREA (ACRES)	559

REASON FOR APPLICATION: 2
(1) Permit to Construct a new facility;
(2) Permit to Modify an existing source;
(3) Permit to Construct a new source at an exsisting facility;
(4) Change of Owner or Location;
(5) Tier I Permit to Operate
(6) Tier II Permit to Operate

DISTANCE TO NEAREST STATE BORDER (MILES)	58		
PRIMARY SIC	3241	SECONDARY SIC	
PLANT LOCATION COUNTY	BANNOCK	ELEVATION (FT)	4554
UTM ZONE	12		
UTM (X) COORDINATE (KM)	397.7	UTM (Y) COORDINATE (KM)	4738.2

List all facilities with the State that are under your control or under common control and have emissions to the air. If none, so state.

NAME OF FACILITIES	LOCATION OF OTHER FACILITIES
None	

OWNER OR RESPONSIBLE OFFICIAL	RON SMITH
TITLE OF RESPONSIBLE OFFICIAL	PLANT MANAGER

Based on information and belief formed after reasonable inquiry
I certify the statements and information in this document are accurate and complete.

SIGNATURE OF OWNER OR RESPONSIBLE OFFICIAL	DATE
R Smith Ronald E. Smith	9/1/06

APPENDIX D

Modeling Files Compact Disc